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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/405,934	09/27/1999	PIERRE JORGENSEN	5509-00100	1061

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EXAMINER

PREISCH, NADINE G

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 12/05/2001

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/405,934

Applicant(s)

JORGENSEN, PIERRE

Examiner

Nadine Preisch

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 21-42 is/are pending in the application.
- 4a) Of the above claim(s) 21-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1 and 26-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11-14-01 has been entered.

Election/Restrictions

Newly submitted claims 32-42 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claims 32-42 are drawn to an apparatus whereas the previously elected invention is drawn to a process.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 32-42 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Objections

Claims 21, 30 and 31 are objected to because of the following informalities: The claimed temperatures do not include the degree symbol. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 21-23, and 26-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over the oral translation of German Patent (1,049,851) in view of "Modern Petroleum Technology" and Kusters (4,426,278).

Applicant is claiming several processes for converting hydrocarbons which might be laden impurities to light products that may be distilled. Applicant claims the processes involve preheating a hydrocarbon load, injecting it into a reactor and passing the load through a high speed jet.

German Patent (1,049,851) discloses a process for the production of light hydrocarbons by thermal cracking with a heat transfer gas which functions in a mechanical sense to transport the starting material and reaction products. See page 2, lines 19-20. The process involves the formation of a heated gas and a hydrocarbon mixture. The heated mixture is passed to a reactor. The mixture is vaporized in a chamber. See page 2, column 1, lines 55-67 and page 2, column 2, lines 1-10. Suitable feeds include high boiling point crudes. See page 1, line 4.

The reference of German Patent (1,049,851) succeeds in disclosing a hydrocarbon cracking process which involves the heating of a hydrocarbon and the addition of a heat transfer gas to the feed which is passed to a reactor. The disclosure of cracking encompasses applicant's

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splitting limitations. The reference's heat transfer gas is considered to correspond to applicant's jet containing energy. In addition, the reference's vaporization of the gas/feed mixture is considered to correspond to applicant's expanding of a load at a second pressure because the gas/feed mixture is converted to a vapor which is less dense. The reference's disclosure of the production of lighter molecules is considered to encompass applicant's breaking of substantially all the molecules into two parts because the lighter products are all portions of heavier molecules. In addition, the reference's disclosure of a high boiling point crude fraction meets applicant's heavy distillate limitation.

It is noted that the reference is silent about the jet mechanically shearing the molecules of the load to produce liquid hydrocarbons. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the high speed introduction through a nozzle inlet of German Patent (1,049,851) which is considered to correspond to a jet would accomplish the same mechanical shearing claimed by applicants because the same high speed injection is performed.

Several differences are noted between German Patent (1,049,851) and applicant's invention. German Patent (1,049,851) is silent about a reactor temperature of less than about 520°C and about a first temperature (preheating) that is about 20°C less than the second temperature. In addition, the reference is silent about the velocity of the jet injected through the nozzle. Furthermore, German Patent (1,049,851) is silent about an additional soaking step.

The reference of "Modern Petroleum Technology" is cited to illustrate that conventional thermal cracking of crude is accomplished at 455-540°C. See page 280, lines 20-21. A conventional process involves "preheating". See page 280, lines 13-14. "Modern Petroleum

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Technology” also illustrates that conventional thermal cracking processes include soaking steps to complete cracking. See page 281, lines 4-6.

The reference of Kusters (4,426,278) is cited to illustrate that preheating temperatures are selected based on the feed to be treated and that such temperatures are typically low enough to prevent significant cracking. See column 5, lines 24-29.

Since the reference of German Patent (1,049,851) does not limit the reactor temperature, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select applicants’ claimed reactor temperature because the reference of “Modern Petroleum Technology” illustrates that such temperatures are conventional for thermal cracking. Applicants have not shown anything unexpected by limiting the process to conventional temperatures.

In addition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select a first temperature (corresponding to a pre-heating temperature) which is 20-25°C less than the second temperature in the reactor because the reference of Kusters (4,426,278) illustrates that preheating temperatures are selected to be low enough to prevent significant cracking reactions. One of ordinary skill in the art would be motivated to select a temperature lower than the thermal cracking temperature employed because cracking is to be avoided during the preheating stage.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to select any jet velocity that would add sufficient mechanical energy in the process of German Patent (1,049,851), including applicant’s specific 700 m/s, because the reference does not limit the speed of injecting so long as mechanical energy is imparted. Applicant has not shown anything unexpected with respect to the claimed gas injection velocity.

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Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made desiring further cracking of the feed in German Patent (1,049,851) to include an additional soaking step because the reference because the reference of "Modern Petroleum Technology" illustrates that a soaking step is known to complete cracking reactions. Applicants have not shown anything unexpected by including an additional conventionally known step.

Claim Rejections - 35 USC § 103

Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over German Patent (1,049,851) in view of "Modern Petroleum Technology" and Kusters (4,426,278) as applied to claims 1, 21-23, and 26-31 above, and further in view of Watson (1,811,195).

A difference is noted between the modified teachings of German Patent (1,049,851) and applicants' claimed invention. The modified teachings are silent about the use of steam as a heat transfer gas.

The reference of Watson (1,811,195) is cited to illustrate that steam is a known heat transfer gas for use in thermal cracking. See page 1, column 1, lines 14-30.

Since the modified teachings of German Patent (1,049,851) do not limit the type of gas injected into the feed, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select steam as the gas injected into the feed because the reference of Watson (1,811,195) illustrates that steam is known to accomplish cracking with the formation of lighter components.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nadine Preisch whose telephone number is 703-305-2667. The examiner can normally be reached on Monday through Thursday from 7:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marian Knode can be reached on 703-308-4311. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3599 for regular communications and 703-305-5408 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0661.

N.P.

December 2, 2001

N.P.

**NADINE PREISCH
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